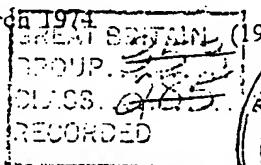


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(54) IMPROVEMENTS IN PIPE UNIONS

(71)	SPEY	Q67	★A1007Y/01 ★GB 1460-864	ction of the
PANY LIL	Mfg. pipe union for incompatible threaded members - by threading			method of
Delta Roac	tubular member, fitting union nut, screwing end member on and			ind set forth
hereby dec	deforming threaded joint			end of the
5 pray that a	SPERRYN & CO LTD 14.03.74-G8-011308			ier member
the method	(06.01.77) F161-19			✓ threads,
be particu	A pipe union for two incompatible threaded members is			the tubular
following s	formed from a stamped union nut (1) held captive on a sta-			other end,
This inve	mped and machined tubular member			er to said
10 providing	(2) secured to a forged member (3).			permanently
first and set	The nut is tapped and the member (3)			int between
which the	has an external tapered thread (6).			said further
more partic	The union is formed, by first forming			✓ radially.
comprising	a thread on one end of the tubular			the further
flange and	member (2) and then passing the nut			✓ a drop of a
member ha	over this end. The member (3) is			applied to
adjacent to	then screwed onto the tubular mem-			per at said
being adap	ber and a ball plunger or roller bur-			other end is formed with an external screw
with the fir	nishing tool inserted to expand the			thread for engagement with a co-operating
20 of the tub	joint to bind the threads of the joint together to form a gas			internal screw thread formed in said further
member by co-operation between the	tight seal. 13. 6. 75 (4pp)			member.
flanges of the nut and the tubular				Usually the further member will be
member on tightening of the union				formed with an external radially extending
nut onto the first member, and a				polygonal flange for engagement by a
further metallic member secured to the				spanner when the further member is
other end of the tubular member and				tightened in use to the second member. It is
adapted to screw-threadedly engage with				this polygonal flange which would prevent
the second screw-threaded member, the				assembly of the union nut onto the tubular
union nut being held captive on the tubular				member if the tubular member were to be
member by the flange on the tubular				made integral with the further member.
30 member and said further member which has				The tubular member and the further
a sufficiently large transverse dimension to				member may be made of any suitable metal
prevent passage of the union nut over said				but preferably they are made of brass.
further member.				The expansion of the joint between the
35 Unions of this kind have been used for				tubular member and the further member is
connecting gas appliances together, for				conveniently performed by cold forming
connecting a meter service governor to a				with a ball plunger or roller burnishing tool.
meter for example.				The invention will now be further
40 It is known to connect the tubular member				described, by way of example only, with
to said further member after assembly of the				reference to the accompanying drawing
union nut onto the tubular member by				which is an axial cross section of a com-
screwing and brazing the tubular member to				pleted brass union adapted to secure an
said further member.				externally screw-threaded first member to an
45 This is, however, an expensive operation,				internally screw-threaded second
requires testing of the seal between the two				member to provide fluid communication
members, and has a high reject rate.				therebetween.
Moreover the seal between the two				95
members may be broken when the union is				

The union comprises a stamped union nut 1 held captive on a stamped and machined tubular member 2 secured to a further member 3 which is a forging.

5 The union nut 1 is internally screw-threaded for engagement with external screw threads on a first member, not shown, and is provided with an internal radial flange 4 for engagement with an external radial flange 5 which is an integral part of one end of the tubular member 2. When the union nut 1 is screwed in use onto the first member the tubular member 2 is drawn towards the first member by the engagement between the flanges 4 and 5.

10 The further member 3 is formed with an external tapered screw thread 6 for engagement with an internal co-operating screw thread of a second member, not shown, and is provided with an integral polygonal radial flange 7 for engagement by a spanner during tightening in use of the further member 7 to the second member.

15 Initially the other end 8 of the tubular member 3 comprises a plain sleeve. Prior to assembly of the union nut 1 onto the sleeve the exterior of said other end 8 is formed with a plain external screw thread for engagement with a complementary screw thread formed internally of the further member 3. The union nut is then assembled onto the tubular member 2 by passing it over said other end 8 of the tubular member. The tubular member and the further member are then screwed together and a ball plunger or roller burnishing tool is inserted into the joint between the members by passing it through the further member 3, and the joint between the members is expanded radially over the distance A by cold forming to increase the internal diameter D of the joint and to bind the screw threads of the joint together to form a gas-tight seal between the tubular member 2 and the further member 3.

20 In one example the initial diameter D is 0.875 inches and a plunging tool of 0.925" diameter is used. The diameter D is thus increased by slightly more than 4% of its initial value.

25 In order to increase the break-loose torque of the joint between the members 2 and 3 a drop of a screw-thread locking material such as that sold under the Registered Trade Mark 'LOCTITE' STÜDLOCK (OR GRADE 75) is applied to the middle part of one of the screw threads before the members 2 and 3 are screwed together.

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WHAT WE CLAIM IS:—

1. A method of manufacturing a pipe union of the kind set forth comprising forming said other end of the tubular member and said further member with complementary screw threads, assembling the union nut onto the tubular member by passing it over said other end of the tubular members, screwing said tubular member to said further member, and then permanently deforming the screw-threaded joint between said tubular member and said further member by expanding the joint radially.
2. The method according to claim 1 in which the tubular member is formed with its screw thread prior to assembling the union nut onto the tubular member.
3. The method according to claim 1 or claim 2 in which prior to screwing the tubular member to said further member screw-thread locking material is applied to at least one of the co-operating screw threads.
4. The method according to any of the preceding claims in which the co-operating screw threads comprise an external screw thread formed on the tubular member and an internal screw thread formed on said further member.
5. The method according to any of the preceding claims in which the expansion of the joint is performed by cold forming.
6. The method according to claim 5 in which the joint between the tubular member is expanded by insertion of a ball plunger.
7. The method according to claim 5 in which the joint between the tubular member is expanded by a roller burnishing tool.
8. The method according to any of the preceding claims in which the tubular member and said further member are of brass.
9. The method according to any of the preceding claims in which the internal diameter of the joint between the tubular member and said further member is increased by more than four per cent of the initial diameter.
10. The method according to claim 1 and substantially as described with reference to the accompanying drawing.
11. A pipe union of the kind set forth produced by the method according to any of the preceding claims.
12. A pipe union of the kind set forth manufactured according to the method of claim 10 and substantially as described with reference to the accompanying drawing.

The union comprises a stamped union nut 1 held captive on a stamped and machined tubular member 2 secured to a further member 3 which is a forging.

5 The union nut 1 is internally screw-threaded for engagement with external screw threads on a first member, not shown, and is provided with an internal radial flange 4 for engagement with an external radial flange 5 which is an integral part of one end of the tubular member 2. When the union nut 1 is screwed in use onto the first member the tubular member 2 is drawn towards the first member by the engagement between the flanges 4 and 5.

10 The further member 3 is formed with an external tapered screw thread 6 for engagement with an internal co-operating screw thread of a second member, not shown, and is provided with an integral polygonal radial flange 7 for engagement by a spanner during tightening in use of the further member 7 to the second member.

15 Initially the other end 8 of the tubular member 3 comprises a plain sleeve. Prior to assembly of the union nut 1 onto the sleeve the exterior of said other end 8 is formed with a plain external screw thread for engagement with a complementary screw thread formed internally of the further member 3. The union nut is then assembled onto the tubular member 2 by passing it over said other end 8 of the tubular member. The tubular member and the further member are 20 then screwed together and a ball plunger or roller burnishing tool is inserted into the joint between the members by passing it through the further member 3, and the joint between the members is expanded radially 25 over the distance A by cold forming to increase the internal diameter D of the joint and to bind the screw threads of the joint together to form a gas-tight seal between the tubular member 2 and the further member 3.

30 In one example the initial diameter D is 0.875 inches and a plunging tool of 0.925 diameter is used. The diameter D is thus increased by slightly more than 4% of its initial value.

35 In order to increase the break-loose torque of the joint between the members 2 and 3 a drop of a screw-thread locking material such as that sold under the 40 Registered Trade Mark 'LOCTITE' STÜDLOCK (OR GRADE 75) is applied to the middle part of one of the screw threads before the members 2 and 3 are screwed together.

WHAT WE CLAIM IS:—

1. A method of manufacturing a pipe union of the kind set forth comprising forming said other end of the tubular member and said further member with complementary screw threads, assembling the union nut onto the tubular member by passing it over said other end of the tubular members, screwing said tubular member to said further member, and then permanently deforming the screw-threaded joint between said tubular member and said further member by expanding the joint radially. 60
2. The method according to claim 1 in which the tubular member is formed with its screw thread prior to assembling the union nut onto the tubular member. 65
3. The method according to claim 1 or claim 2 in which prior to screwing the tubular member to said further member screw-thread locking material is applied to at least one of the co-operating screw threads. 70
4. The method according to any of the preceding claims in which the co-operating screw threads comprise an external screw thread formed on the tubular member and an internal screw thread formed on said further member. 75
5. The method according to any of the preceding claims in which the expansion of the joint is performed by cold forming. 80
6. The method according to claim 5 in which the joint between the tubular member is expanded by insertion of a ball plunger. 85
7. The method according to claim 5 in which the joint between the tubular member is expanded by a roller burnishing tool. 90
8. The method according to any of the preceding claims in which the tubular member and said further member are of brass. 95
9. The method according to any of the preceding claims in which the internal diameter of the joint between the tubular member and said further member is increased by more than four per cent of the initial diameter. 100
10. The method according to claim 1 and substantially as described with reference to the accompanying drawing. 105
11. A pipe union of the kind set forth produced by the method according to any of the preceding claims. 110
12. A pipe union of the kind set forth manufactured according to the method of claim 10 and substantially as described with reference to the accompanying drawing. 115

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